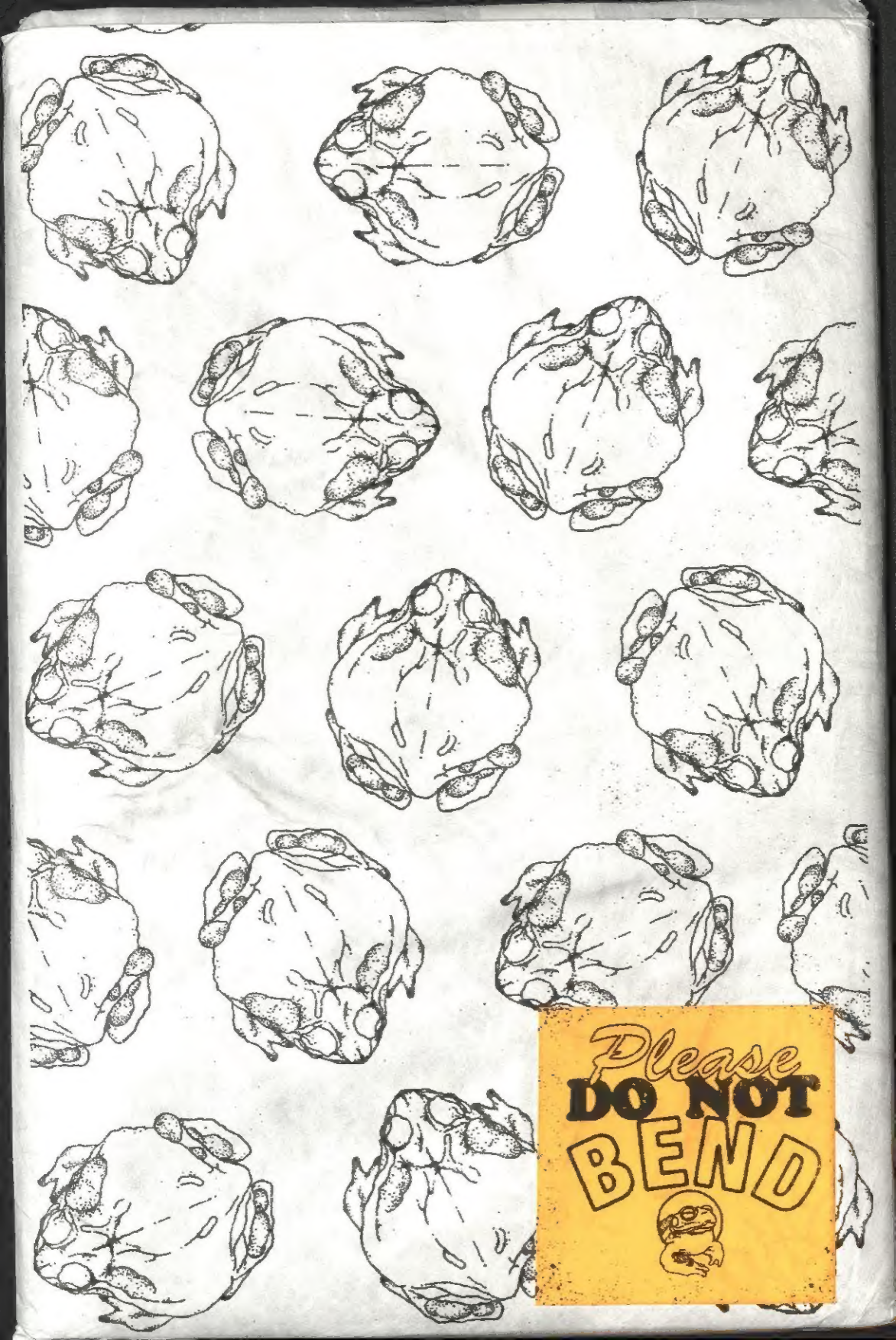

Please
DO NOT
BEND

Bufo alvarius:

the

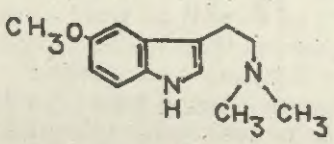
PSYCHEDELIC TOAD

of the Sonoran Desert

by Ken Nelson

expanded and updated edition by Hamilton Morris

LEAVE TOADS ALONE!



CHOOSE SUSTAINABLE, LAB-PRODUCED

5-MEO-DMT

Bufo alvarius:

the

PSYCHEDELIC TOAD

of the Sonoran Desert

by Albert Most

venom
press

1st Printing
Spring 1984

2nd Printing
Spring 1985

3nd Printing
Winter 2020

4th Printing
Winter 2021

5th Printing
Spring 2021

to Pat and Quanah
Summer 1983

PREFACE TO THE 2020 EDITION

The original version of this pamphlet was created in 1983 by Ken Nelson (1954-2019), an environmentalist, anti-nuclear activist, artist, and independent researcher from Denton, Texas.

Ken is remembered as a relentlessly inquisitive and contrarian spirit, and a life-long advocate for peace and environmental justice. His desire to understand the forces working against these ideals led him to enlist in the US Army Rangers in the early 1980s. While stationed near Savannah, Georgia, Ken was intrigued by an article in the August 1981 edition of Omni magazine summarizing a recent hypothesis by Dr. Jeanette Runquist concerning the possible psychoactive use of Bufo genus toads by protohistoric Cherokee groups around present-day Franklin, North Carolina.

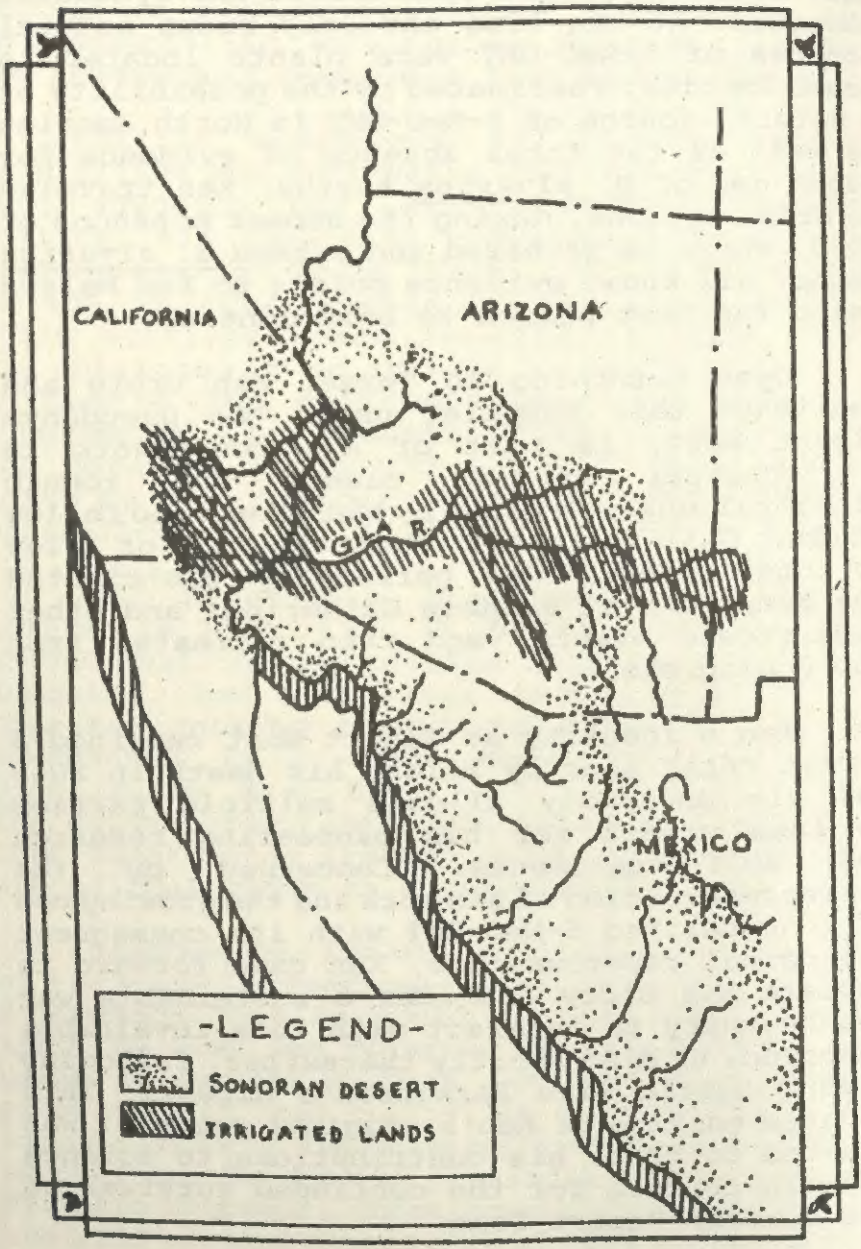
Dr. Runquist's hypothesis was later refuted in 2014 by Dr. J. Matthew Compton, who argued that the decapitated toad skeletons Dr. Runquist had discovered were indicative of Cherokee cooking traditions much like those documented in a 1951 compendium, Cherokee Cooklore by Mary Ulmar and Samuel E. Beck. The contemporary anthropological consensus is that these bones are not evidence of Cherokee use of toad venom as a psychoactive drug.

Nonetheless, Ken was inspired by the concept of a psychedelic toad and endeavored to understand a practice that he would in fact create. Ken left the army and returned to Texas, where he began an earnest inquiry into the psychedelic properties of toad toxins. In the Department of Life Sciences at the University of North Texas he encountered the work of Italian toxicologist Dr. Vittorio Erspamer, whose comprehensive chemical analysis of toad venoms showed that among the 40 species he analyzed from the genus Bufo, a single one, Bufo alvarius (syn. Incilius alvarius), was capable of biosynthesizing 5-MeO-DMT.

5-MeO-DMT was virtually unknown to the psychedelic community of the early 1980s, outside of a small number of scientific and mail-order suppliers that offered the synthetic compound. At the time the only known natural sources of 5-MeO-DMT were plants located in South America. Fascinated by the possibility of a natural source of 5-MeO-DMT in North America as well as the total absence of evidence for human use of B. alvarius toxins, Ken traveled to Gila, Arizona, during the summer monsoons of 1983, where he gathered and smoked B. alvarius venom. All known evidence points to Ken Nelson being the first person to have done so.

Upon returning to Texas, Ken wrote and published this pamphlet under the pseudonym Albert Most, as part of his coursework in a technical writing class. The iconic illustrations were drawn by his friend and fellow student Gail Patterson. With the help of a few co-conspirators, Ken personally distributed the pamphlets at Rainbow Gatherings and other underground events, and then retreated from the public eye.

Ken's identity as Albert Most remained a secret until shortly before his death in 2019 and his anonymity allowed multiple parties to take credit for his pioneering research and self-experiments. Concerned by the misrepresentation of his work and the growing use of toad-derived 5-MeO-DMT with its consequent ecological repercussions, Ken came forward to explain his story and offer a sustainable way for humanity to interact with this invaluable compound. He died shortly thereafter, following a long battle with Parkinson's disease. This updated edition of Ken's original pamphlet was created to honor his contributions to science and his concern for the continued survival of the Sonoran Desert Toad.

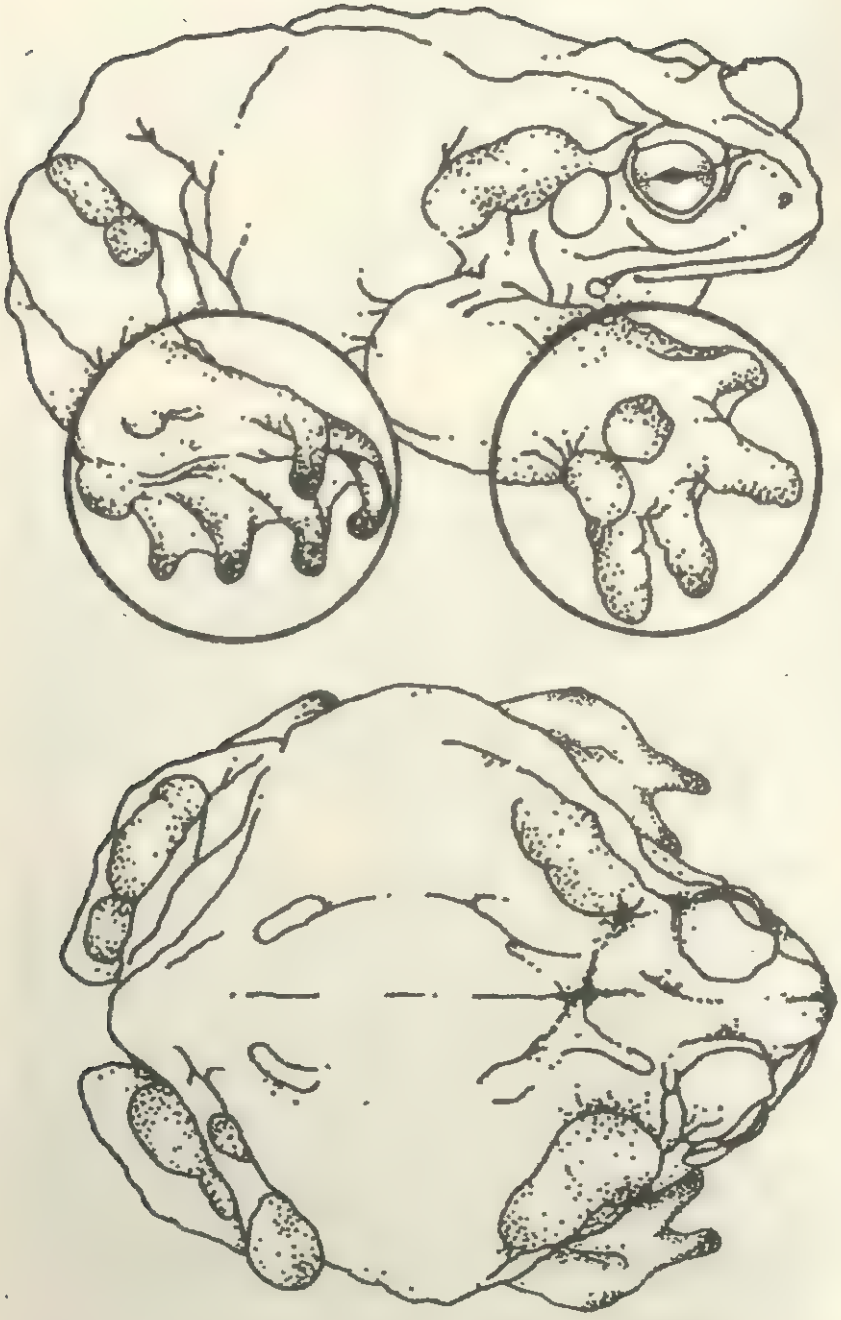

CALIFORNIA
ARIZONA
GILA R.
MEXICO
-LEGEND-
SONORAN DESERT
IRRIGATED LANDS

Part One

The Sonoran Desert is a vast irregular-shaped area of some 120,000 square miles. It stretches from southeastern California across the southern half of Arizona and extends south into Sonora, Mexico. The desert rises from sea level to more than 5000 feet as arid lowlands of mesquite and creosote are cut by mountain canyons of oak and sycamore. It is a harsh zone where temperatures can reach 140 F in the shade and rainfall amounts at as little as five inches per year.

One of the most unique inhabitants of the Sonoran Desert is the native toad, Bufo alvarius. Although the genus Bufo includes more than two hundred species of toads, B. alvarius is the only species that exists exclusively within the Sonoran Desert. Unlike most toads, B. alvarius is semi-aquatic and must remain in the vicinity of dependable water in order to survive. Consequently, the principle habitat of this species is within the drainage of permanent rivers and streams of the Sonoran Desert.

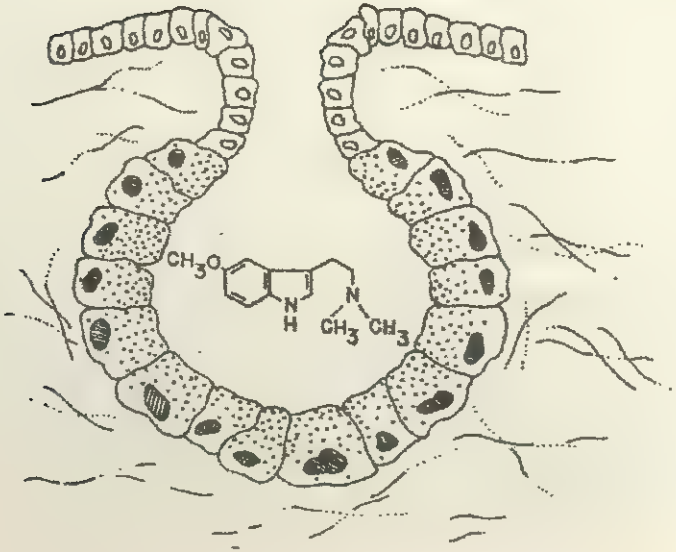
This delicate desert environment, like most places on earth, has not been overlooked by man in his constant compulsion to manipulate nature. But amazingly enough, the semi-aquatic lifestyle of B. alvarius has coincided quite well with the advance of civilized man. More than one thousand years ago, the Hohokam Indians began diverting water from the Gila River in order to irrigate the arid soil. Working with sticks and stones these primal people pioneered an extensive system of desert agriculture. Their original network of canals has been expanded for centuries and now irrigates more than 1.5 million acres of the Sonoran Desert. This is equivalent to



regularly flooding an area of arid land about half the size of the state of Connecticut. The damp wet desert fields meet man's increasing needs and simultaneously provide a permanent niche in the ecosystem for B. alvarius, the semi-aquatic toad of the Sonoran Desert.

B. alvarius is nocturnal and remains underground throughout the day, escaping the extreme temperatures with the strategy of subterranean life. At dusk, these desert toads leave their hidden recesses and congregate in damp wet areas near springs and streams, in fields irrigated for agriculture, or in temporary pools left after heavy rains. The breeding season, May through July, is the period of greatest activity for B. alvarius. Large healthy toads can easily be gathered after dark using a flashlight and a cloth collection bag.

You won't have any trouble identifying B. alvarius. It is the largest native North American species of toad. In terms of snout-to-vent length, B. alvarius requires a minimum of three inches for sexual maturity, although breeding adults continue to grow up to seven inches in length. This desert dweller is of stout build with a squat body and a flat broad head. The skin is smooth and leathery, sparsely covered with pale orange warts, and can change considerably from a dark brown to olive or grayish green. The belly is cream colored and usually unmarked. There are one to four prominent round white warts at the corner of the mouth. But, by far, the most identifying characteristic of B. alvarius is the presence of large granular glands on the neck and limbs.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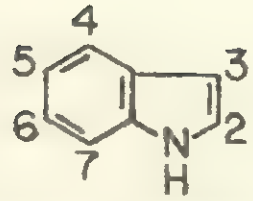
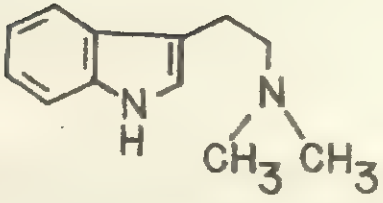
The granular glands are specialized multi-cellular concentrations of tissue. The most prominent of these is the pair of large kidney-shaped parotoid glands located one on each side of the neck, over and behind the tympanum. Enlarged and elongated glands on the outside of each hind leg, between the knee and thigh, are called femorals. Similarly, the tibeals are long glands, or a line of shorter ones, that run the full length between the knee and ankle. An additional gland concentration can be found on each of the forearms.

Each of these glands consists of many oval-shaped lobules about two millimeters in diameter. Each lobule is an individual unit with a duct that emerges onto the skin as a well-defined, single pore. A double cell layer surrounds each lobule and functions in the synthesis and release of a viscous milky-white venom.

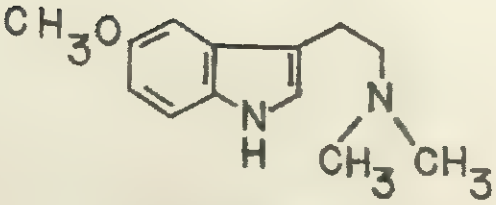
The venom from B. alvarius contains a very peculiar and constant spectrum of biogenic amines. Biosynthesis of the amines is accomplished via a genetically regulated enzyme system. The metabolic pathway of B. alvarius is unique within the Animal Kingdom in that it produces large amounts of 5-methoxy indole derivatives. The predominant alkaloid among these, as much as fifteen per cent of the venom by dry weight, is 5- methoxy- N,N-dimethyltryptamine (5-MEO-DMT).



INDOLE RING
Parent Molecule



DMT
Controlled Substance



5-MEO-DMT
Relatively Unknown

5-MEO-DMT is a potent hallucinogen, psychoactive in man at doses of three to five milligrams. It was first synthesized in 1936, but its mind-expanding effects were not discovered for more than twenty years. Then in 1959, 5-MEO-DMT was identified as the predominant alkaloid in the hallucinogenic snuffs of several tribes in South America. These primal people have long prepared mind-altering snuffs from flowers, seeds, bark, and stems of indigenous plants. In 1968, 5-MEO-DMT was detected in the Animal Kingdom, as well. B. alvarius became notorious as the "psychedelic toad" when its venom was shown to contain enormous amounts of this indole-based alkaloid. Whether extracted from North American toads or South American plants or synthesized in the laboratory, 5-MEO-DMT is an extremely potent hallucinogen.

5-MEO-DMT has ten times the relative potency of dimethyl tryptamine (DMT), the popular synthetic psychedelic drug of the 1960's. It should be mentioned, however, that 5-MEO-DMT differs from DMT in two major ways. First, whereas 5-MEO-DMT has a methoxy group in the 5 position on the indole ring, DMT does not. The presence of this methoxy group greatly increases the lipid solubility of the molecule. This allows 5-MEO-DMT to penetrate the blood-brain barrier and reach sites of action more rapidly than DMT. Secondly, whereas DMT is classified as a Schedule I Controlled Substance, described by Title 21 of U.S. Code as having "a high potential for abuse and no currently accepted medical use", 5-MEO-DMT is relatively unknown.

Part Two

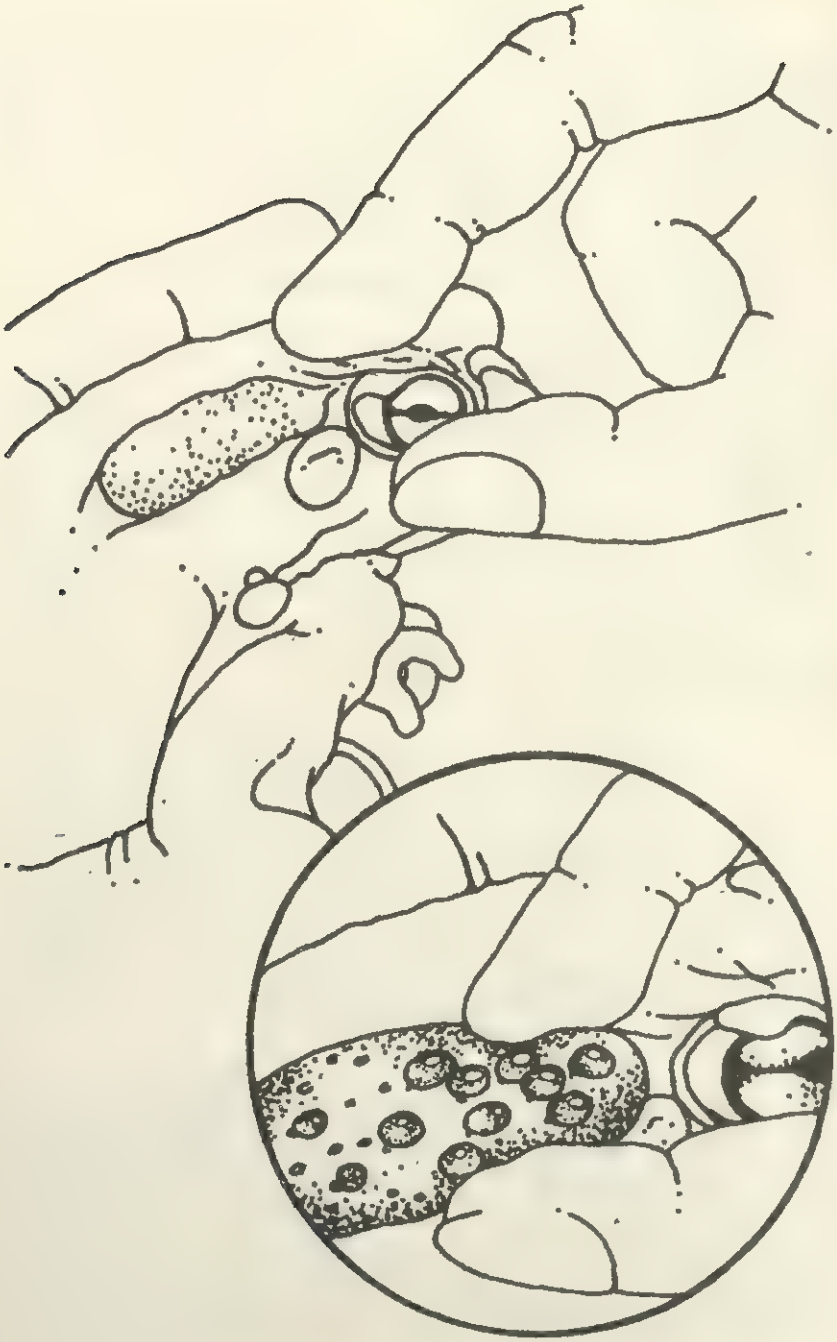
"A certain man had the good fortune to possess a goose that laid a golden egg every day. But dissatisfied with so slow an income, and thinking to seize the whole treasure at once, he killed the goose; and cutting her open, found her -- just what any other goose would be."

The Goose with the Golden Eggs by Aesop

Half-a-gram to a gram or more of fresh venom can be collected from a large adult specimen of B. alvarius. Half of this weight is water and evaporates upon drying. But, as much as fifteen per cent of the dry weight is the predominant alkaloid, 5-MEO-DMT. In other words, one large toad yielding one gram of fresh venom may equal as much as seventy-five milligrams of potent hallucinogen, psychoactive in man at doses of three to five milligrams.

Fresh venom can easily be collected without harm to the toad. Use a flat glass plate or any other smooth non-porous surface at least twelve inches square. Hold the toad in front of the plate, which is fixed in a vertical position. In this manner, the venom can be collected on the glass plate, free of dirt and liquid released when the toad is handled.

When you are ready to begin, hold the toad firmly with one hand and, with thumb and forefinger of your other hand, squeeze near the base of the gland until the venom squirts out of the pores and onto the glass plate. Use this method to systematically collect the venom from each of the toad's granular glands: those on the forearm, those



on the tibia and femur of the hind leg and, of course, the parotoids on the neck. Each gland can be squeezed a second time for an additional yield of venom if you allow the toad a one hour rest period. After this, the glands are empty and require four to six weeks for regeneration.

The venom is viscous and milky-white in color when first squeezed from the glands. It begins drying within minutes and acquires the color and texture of rubber cement. Scrape the venom from the glass plate, dry it thoroughly, and store it in an airtight container until you are ready to smoke it.

The venom from B. alvarius is extremely hallucinogen when vaporized by heat and taken into the lungs in the form of smoke. An adequate dose for a normal adult of average size is a piece of dried venom about the size of a paper match head. Shave it into thin slices with a razor blade and put the pieces in a clean one-toke pipe fitted with a brass screen. Designate this pipe strictly for smoking toad venom, as the accumulation of residue in the bowl and condensation of vapors within the stem can yield an unintentional high with other smoking materials.

Apply a suitable flame and smoke the contents of the bowl in one complete inhalation. Try to hold the smoke in your lungs as long as possible as the effectiveness will depend largely on the full dose being absorbed in one breath.

Within thirty seconds, there will be an onset of almost overwhelming psychedelic effects. You will be completely absorbed in a complex chemical event characterized by an

overload of thoughts and perception, brief collapse of the EGO, and loss of the space-time continuum. Relax, breathe regularly, and flow with the experience. After two to three minutes, the initial intensity fades to a pleasant LSD-like sensation in which visual illusions, hallucinations, and perceptual distortions are common. You may sense a distortion in your perceived body image or notice the world shrinking or expanding. You may notice that colors seem brighter and more beautiful than usual. And, most likely, you will experience a euphoric mood interspersed with bursts of unmotivated laughter.

This ineffable episode is of extremely short duration. The hallucinogenic effects dissipate rapidly and the entire psychedelic cycle is completed within fifteen minutes. There is no hangover or harmful effect. On the contrary, a pleasant psychedelic afterglow appears quite regularly and may last several hours to several days after smoking the venom of B. alvarius, the Psychedelic Toad of the Sonoran Desert.

IMPORTANT CONSIDERATIONS

Every psychedelic experience is chiefly a function of set and setting, of preparation and environment. The better prepared you are, the better the experience will be for you. Consider the following instructions:

* Smoke the venom fairly early in the day on an empty but not starving stomach.

* Do not drink any alcohol or take any drugs or medication prior to smoking the venom.

* Provide a comfortable setting which is as free as possible from unforeseen distractions and intrusions. Make sure you will not be disturbed for at least thirty minutes.

* Be comfortably seated or prone prior to inhaling the vapors.

* Enjoy your trip!

Albert Most
Gila, Arizona
Summer 1983

RECOMMENDED READING

The Handbook for the Serious Toad Collector, by Albert Most

Everything you could possibly want to know about the "psychedelic toad" is covered in this illustrated guide to B. alvarius. Beginning with the mating call and mounting clasp, the author details the metamorphosis of B. alvarius through egg and tadpole stages up to the mature adult. A special section on induced ovulation and tadpole culturing describes how the serious toad collector can, at any time, induce spawning in pet toads and insure insemination of the 8000 eggs laid by the adult female. Price $5.00

Peganum harmala: The Hallucinogenic Herb of the American Southwest, by Albert Most

The psychoactive alkaloids present in P. harmala have such extraordinary effects that they have earned the name "telepathines." The author presents an illustrated guide to the history, botany, chemistry, cultivation, preparation, use, and effects of this most unusual hallucinogenic plant. Price $3.00

Eros and the Pineal, by Albert Most

This unusual do-it-yourself guide details the manipulation of normal biogenic amines in the human brain. The author presents a safe and effective procedure for increasing the concentration of pineal serotonin, blocking its normal enzymatic inactivation, and shifting pineal catabolism towards the production of endogenous hallucinogens. Fully illustrated and highly recommended. Price $5.00

KEN'S WISHES

Ken Nelson was a citizen scientist who worked without funding or a laboratory during one of the darkest eras of drug prohibition in United States history. The notes he left behind indicate that he was interested in alternatives to toad milking and the synthetic production of 5-MeO-DMT. There are two key pieces of evidence for this.

The first is an unpublished book, referenced in the original pamphlet, titled The Handbook for the Serious Toad Collector. This follow-up to the present volume would have outlined the cultivation of Bufo alvarius, including techniques for artificial insemination, inducing ovulation, and culturing toads from tadpole to mature adult. When I asked Ken's friends why it was left unpublished, they told me that he had ultimately decided he didn't want to further destructive human interference in Sonoran Desert Toad populations.

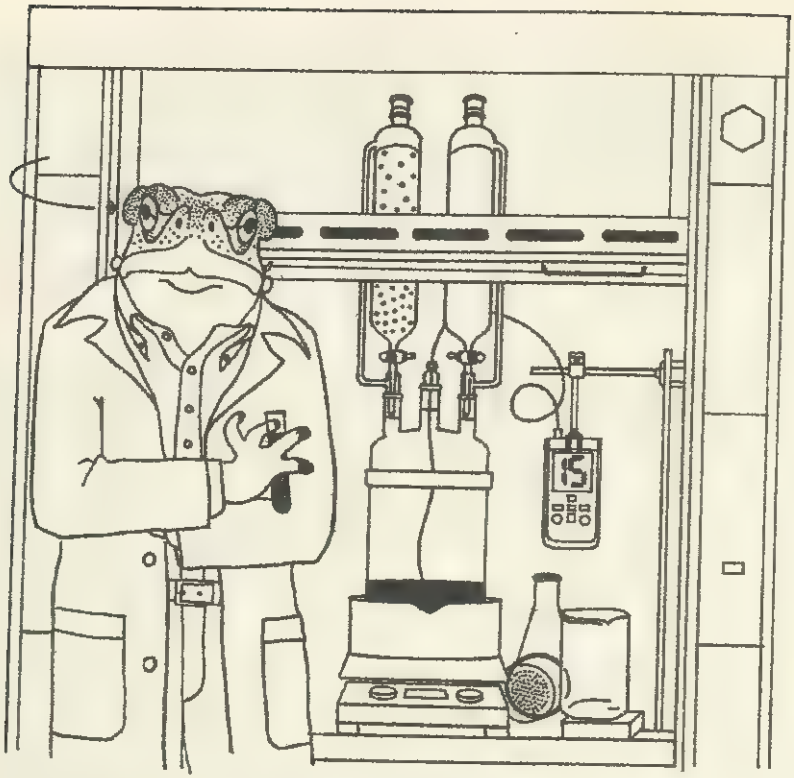
The second piece of evidence is that Ken left behind extensive plans for the in vitro enzymatic synthesis of 5-MeO-DMT in bioreactors, starting from tryptamine and employing enzymes such as indole-O-methyltransferase and S-adenosyl-L-methionine — the same enzymes that are present in the parotoid glands of B. alvarius. Ken was never able to test any of his planned bioreactors. The idea — well ahead of its time — may indeed be possible and will pose an exciting challenge to future generations of researchers.

B. alvarius is a tenacious brute, the size of a hamburger, with a lifespan that can exceed 15 years in captivity. I have personally observed specimens thriving in the wild with a missing eye or limb. Their unforgettable appearance has earned them a place in the traditions of the Yaqui people of Sonora, but the forces of habitat destruction, climate

change, and poaching have threatened their continued survival. Due to the urgent need for a non-animal source of 5-MeO-DMT, I am emphasizing the conventional techniques of organic synthesis. It is my genuine belief that the following procedure upholds the spirit of what Ken, a lifelong environmentalist, would have wanted – an efficient, high yielding, and green process for the production of 5-MeO-DMT.

Unfortunately, as of 2011 the possession of 5-MeO-DMT is a felony offense under the federal Controlled Substances Act, as well as the laws of several states. Synthesis and distribution of the compound carries even more severe penalties. Many other countries, including Mexico, do not explicitly prohibit the use or production of 5-MeO-DMT.

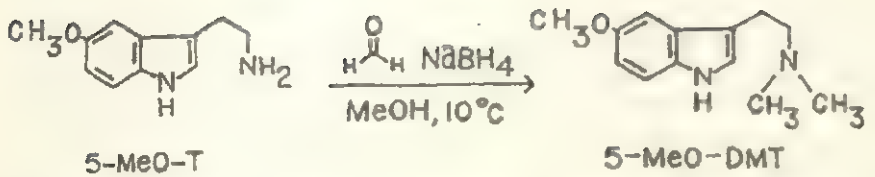
One chemist with three days and approximately $500 worth of chemicals and glassware can make enough 5-MeO-DMT to produce thousands of life-altering experiences. Although I don't believe there is anything immoral about selling a psychedelic like 5-MeO-DMT, I would encourage anyone reading this guide not to do so. Take pride in your ability to make something good. If one life is changed for the better, consider yourself amply remunerated.



A GREEN AND SUSTAINABLE SYNTHESIS OF 5-MeO-DMT

Conventional synthetic wisdom has held that sodium borohydride ($NaBH_4$) is too strong of a reducing agent to be used in reductive amination procedures where an imine is formed in situ because carbonyl reduction would precede imine condensation producing an alcohol without the formation of the desired carbon-nitrogen bond. Reductive amination of tryptamines carries the additional risk of β-carboline side products via a pH and temperature-dependent Pictet-Spengler reaction.

A common solution to this problem has been to employ a borohydride reducing agent where one or more hydrogen atoms have been



5-MeO-T 5-MeO-DMT

replaced with substituents that sterically and electronically reduce reactivity, rendering it incapable of carbonyl reduction. The most common example of this is sodium cyanoborohydride ($NaBH_3CN$) with less common use of sodium triacetoxyborohydride as well as a variety of substituted ammonia-borane hydrides. These reducing agents are considerably more expensive[1] than $NaBH_4$ and, in the case of $NaBH_3CN$, add the hazard of hydrogen cyanide production during synthesis.[2] Furthermore, it has been my personal experience that $NaBH_3CN$ can leave trace impurities (likely amino-cyanoborane adducts or N-cyanomethyltryptamines) in the product that smell of cyanide even after purification via column chromatography and recrystallization. The toxicity of these trace impurities is unknown, but suffice it to say they are undesirable.

As early as 1963,[3] chemists noted that the reactivity of $NaBH_4$ could be tempered by conducting reductive aminations at 0°C, but half a century would elapse before these techniques would be applied to tryptamine chemistry. When $NaBH_4$ was employed it was either used as part of a relatively complex multi-step alkylation or the yields were an abysmal 3% with the major product being tetrahydro-β-carboline (THβC). This changed in 2014 when Yi He and Xiaolong Li demonstrated that one-pot $NaBH_4$ reduction was applicable to the synthesis of rizatriptan, a ring-substituted analog of DMT, provided that the reaction was conducted under non-acidic conditions and kept below 20°C. This work inspired several chemists in both academic and clandestine

laboratories to reproduce and extend the scope of the technique. At the time of writing, $NaBH_4$ reductive amination has been successfully used in the synthesis of DMT, 5-MeO-DMT, DPT, and other dialkyltryptamines from a gram to multi-kilogram scale. It is my opinion that the following process represents the cheapest, easiest, safest, and most environmentally friendly method for non-enzymatic production of 5-MeO-DMT.

5-METHOXYTRYPTAMINE

5-methoxytryptamine is prohibitively expensive via most domestic chemical supply companies, but can be purchased inexpensively from China. The freebase is a light brown powder that smells pleasantly of grape and melts between 121.0-123.0°C. It can be purified via recrystallization in 95% ethanol. Purchasing 5-methoxytryptamine is cheaper, faster, and less wasteful than producing it oneself, but it can be prepared from melatonin, a widely available sleep aid, in the following manner.

30 g melatonin (0.12915 moles) is suspended in 150 mL isoamyl alcohol containing 30 mL MeOH to facilitate dissolution. With vigorous stirring, 2.14 g sodium dithionite (0.01229 moles) is added followed by 16 g freshly crushed NaOH pellets (0.40003 moles). Care must be taken to ensure the NaOH does not form a solid cake that prevents stirring. The reaction is then heated to reflux under a blanket of inert gas. The initially transparent yellow solution will acquire a tan color and thicken. After 2.5 h reflux with monitoring the deacetylation is complete as indicated by GC-MS. The reaction is removed from heat, cooled to RT and added to 300 mL distilled H_2O. The aqueous phase is extracted with 4 x 60 mL toluene. The organic phases are pooled and washed with H_2O (4 x 100 mL) and brine (3 x 100 mL). The organic phase is then extracted with 3N aqueous HCl (3 x 120 mL). The acidic

aqueous extracts are pooled, made basic with NaOH pellets and extracted with ethyl acetate (3 x 100 mL). The pooled organic extracts are washed with saline (1 x 10 mL), dried with anhydrous sodium sulfate, and evaporated under reduced pressure to yield an amber oil which spontaneously sets to a tan crystalline solid. The solids are recrystallized by dissolving in 50 mL 95% ethanol at -20°C overnight. The resulting crystals are collected by decanting the solvent, washing with a small amount of ice-cold ethanol, and drying in an oven at 60°C. The tan solids are crystallized once more as above to give 11.4 g large transparent amber crystals of 5-methoxytryptamine. Additional crops can be obtained but require further purification.

5-METHOXY-N,N-DIMETHYLTRYPTAMINE

The following procedure is a synthesis of personal experience and reports I have collected from other chemists. Although this process is a refinement of many similar procedures, it is by no means optimized. I will describe some problems I have encountered and how best to avoid them. The potential synthesist should recognize that the ideal conditions are dependent on reaction scale and availability of reagents and equipment. Some chemists will have access to a mechanically stirred three-neck borosilicate reaction kettle that is jacketed and chilled with a recirculating reservoir of -45°C aqueous ethylene glycol; other chemists will be limited to a stainless steel soup pot and a Rubbermaid tote filled with salted ice – plan accordingly.

100 g 5-methoxytryptamine freebase (0.52564 moles) is poured into a 10 L, three-neck reaction kettle nested inside a 3.5 L ice bath. With magnetic stirring, the tryptamine is dissolved in 4.5 L of MeOH forming a translucent brown solution. The bath is filled with pellets of dry ice, followed by MeOH and

the 5-methoxytryptamine solution is allowed to cool until it has reached 0°C.

100 g $NaBH_4$ (2.643 moles)[4] is dissolved in 250 mL (10.6 M) of a 3% KOH solution.[5] This solution should be cooled in an ice bath to at least 15°C before being transferred into an addition funnel with a pressure-equalization arm.[6] Charge a second addition funnel with 400 mL (5.37 moles) 37% formaldehyde solution[7] and begin a dropwise addition,[8] carefully monitoring the temperature so that it stays between -5 and 15°C.[9]

Once the formaldehyde and $NaBH_4$ have been added, it is advisable to begin monitoring the reaction via TLC with a mobile phase of 4:1 MeOH:EtOAc.[10] The rank order of Rf values should be as follows: 5-MeO-T<5-MeO-NMT<5-MeO-DMT<6-MeO-THβC. I have only encountered prominent spots for the starting material and the product.

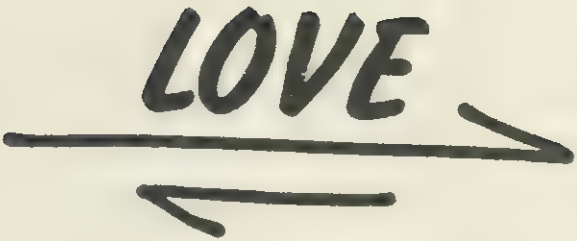
Once TLC or mass spectrometry have demonstrated that reductive amination is complete, the solution can be allowed to warm to room temperature and borate salts will begin settling to the bottom of the vessel. At this point the supernatant can be decanted or, if one has access to a sufficiently large Buchner funnel, the entire reaction mixture can be subjected to vacuum filtration and the solvent can be stripped from the filtrate using a rotary evaporator. If a rotary evaporator is unavailable the filtered solution can be boiled with stirring, but if the borate salts are not filtered off before the boiling begins they can coat the bottom of the vessel and cause uneven heating, leading to decomposition of product and breakage of glassware.

MeOH (BP 64-65°C) will boil off before water and as the MeOH concentration decreases, the 5-MeO-DMT freebase oil will precipitate from the solution and rise to the surface as

a dark brown oil. When the boiling point of the solution reaches 93°C, the concentration of MeOH is less than 10% and the solution is sufficiently polar to allow extraction with an organic solvent.

At this point, the scale of the reaction and availability of equipment for purification will strongly influence how best to proceed. The 5-MeO-DMT freebase can be extracted with ethyl acetate then dried with sodium sulfate, and the solvent can be stripped from the base with a rotary evaporator. The crude base may crystallize spontaneously after sitting at room temperature and the crystals can be purified by dissolution in boiling hexanes or heptane and left to cool to room temperature, at which point the solution should be transferred into a refrigerator and allowed to crystallize overnight. The recrystallization can be repeated as many times as necessary to achieve a product of satisfactory purity. The crude product can also be filtered through a plug of silica gel to remove colored impurities and then subjected to additional purification.

Due to the vast quantities of organic solvent required for recrystallization, larger scale reactions may benefit from purification via short path vacuum distillation. The crude 5-MeO-DMT base is allowed to dry so that any residual water or methanol are no longer present, then transferred into a short path distillation apparatus, ideally with a heating mantle and vacuum capable of pulling at least 1.0 mm/Hg. 5-MeO-DMT freebase boils at 160-170°C at 0.6 mm/Hg. Care should be taken to allow the distillate to cool to room temperature before breaking the vacuum to avoid rapid thermal decomposition. The distillate may spontaneously crystallize on cooling and can be recrystallized to yield 5-MeO-DMT of exceptional purity with a MP of 145-146°C.


LOVE

ENDNOTES

1. $NaBH_4$ is typically less than half the cost of other borohydride reducing agents and is commercially available at higher purities. At the time of writing, one kilogram of 98% $NaBH_4$ can be ordered from China for $220.

2. If $NaBH_3CN$ were employed in a reductive amination at the scale described in this book it would have the theoretical capacity to evolve more than 22 g of hydrogen cyanide, a fatal dose many times over. In practice, proper ventilation and control of reaction conditions make $NaBH_3CN$ a reasonably safe reagent, but alternatives should be pursued when they are available.

3. Karl A. Schellenberg, 1963, The Synthesis of Secondary and Tertiary Amines by Borohydride Reduction.

4. Every mole of $NaBH_4$ has the theoretical ability to reduce four moles of imine, but the $NaBH_4$ is also reacting with the solvent system and likely begins to lose reductivity after donation of the first hydride, for this reason it is used in stoichiometric excess.

5. It is better to add a saturated $NaBH_4$ solution with a small amount of suspended, undissolved $NaBH_4$ than it is to introduce the additional water required to dissolve it. Some chemists have successfully carried out this procedure adding the $NaBH_4$ to the reaction mix as a solid powder. Although it can be done, this increases the likelihood of thermal spikes producing β-carboline side products and a small amount of water increases the solubility of the $NaBH_4$ in cold MeOH. Conversely, too much water will slow the evaporative workup and cause tryptamine bases to *aggressively* precipitate forming an intractable brown tar that will trap a magnetic stir bar and cause considerable frustration if an overhead stirrer and additional MeOH are not available to facilitate redissolution. A carefully controlled ratio of water to MeOH preserves the amphiphilicity of the solvent system allowing both tryptamine bases (non-polar) and $NaBH_4$ (polar) to remain in solution. A rule of thumb is to never let the water concentration of the reaction mix exceed 10%.

6. 40% $NaBH_4$ should represent a near saturated solution at 12.5°C. Although KOH increases the stability of aqueous $NaBH_4$, its gradual decomposition will be evident from the continuous evolution of hydrogen gas. This reaction should not be carried out in a closed vessel because the pressure will build and, at the very least, pop a joint or septum.

7. Typical commercial formaldehyde solutions are 48-53% water with 10-15% MeOH, which is used as a stabilizer to prevent formaldehyde's polymerization into paraformaldehyde.

8. Many chemists have used a simultaneous dropwise addition of the formaldehyde and $NaBH_4$ solutions. A mechanistic argument can be made for alternating additions, but the reaction will rapidly proceed to completion as long as there is not a tremendous excess of $NaBH_4$ which reduces the formaldehyde before it has time to condense with the amine.

9. 100 mL of 37% formaldehyde contains 1.23 moles and 100 mL of a 40% $NaBH_4$ solution contains 1.57 moles, thus the $NaBH_4$ solution is more concentrated. Accordingly, the rate of formaldehyde addition should be faster than the rate of $NaBH_4$ addition. This reductive amination occurs rapidly and the addition can be carried out quickly on a small scale, but a larger scale necessitates an especially cautious addition because both imine formation and $NaBH_4$ reduction are exothermic and it is crucial for the reaction to be kept between -10°C and 15°C. Anything over 20°C risks a Pictet-Spengler side reaction that will produce pinoline (6-MeO-THβC) and N-methyl-pinoline (6-MeO-2-Me-THβC).

10. This mobile phase produces less than satisfactory separation, but it has the advantage of reusing solvents already present for the reaction. An improved solvent system is pure ethanol or methanol with 1% triethylamine.

Specialized multi-cellular glands concentrated on the neck and limbs of B. alvarius produce a viscous milky-white venom that contains large amounts of the potent hallucinogen 5-MeO-DMT. When vaporized by heat and taken into the lungs in the form of smoke, this indole-based alkaloid produces an incredibly intense psychedelic experience of extremely short duration. There is no hangover or harmful effect. On the contrary, a pleasant psychedelic afterglow appears quite regularly after smoking the venom of B. alvarius, the Psychedelic Toad of the Sonoran Desert.

In this expanded and updated edition of the 1983 ethnoherpetological classic, the story of how Ken Nelson (pseud. Albert Most) discovered and smoked the psychedelic venom of B. alvarius is told for the first time. Additionally, a green and sustainable 5-MeO-DMT synthesis is presented to protect natural toad populations and accommodate the growing international demand for this extraordinary psychedelic.

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